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CITATION:

PICKFORD, Martin ...[et al]. Fossiliferous Localities of the Nachola-Samburu Hills Area, Northern Kenya. African study monographs. Supplementary issue 1984, 2: 45-56

ISSUE DATE:

1984-03

URL:

https://doi.org/10.14989/68317

African Study Monographs, Supplementary Issue 2: 45–56, March 1984

# FOSSILIFEROUS LOCALITIES OF THE NACHOLA-SAMBURU HILLS AREA, NORTHERN KENYA

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ABSTRACT In the four geographic/stratigraphic areas of the Samburu Hills and Nachola, west of Baragoi, Kenya, a significant number of fossiliferous localities was found. Nachola area is dated to the middle Miocene, the Namurungule Formation in Samburu Hills to the upper Miocene, Kongia area to the Mio-Pliocene and Holocene to the area near Suguta Valley and in the drainage systems of the Samburu Hills to the Holocene. The site BG X in Nachola yielded a number of fossils provisionally assigned to *Kenyapithecus*. An important large hominoid specimen occurred in Site SH 22 of the Namurungule Formation. Undoubtedly a great many additional sites await discovery.

## INTRODUCTION

Fossils were known to occur in a few places between Baragoi and the Suguta Valley many years ago, but little systematic study was undertaken until 1980. Previous to this, fossil wood was collected at Emuruilem (Site BG W) by amateurs (Baker, 1963).

In 1980, the Japan-Kenya Expedition, under direction of one of the authors (H.I.), started prospecting west of Baragoi and located a number of fossiliferous areas near Nachola (Ishida *et al.*, 1981). During 1982 an extended field season was spent in the region and a significant number of important sites was found ranging in age from middle Miocene to Holocene.

This report is to place on record basic information concerning localities discovered during the 1982 field season. The basic data includes the position of each site plotted on aerial photographs; the stratigraphic position of each site, and details of taxa collected therefrom, together with the total number of fossils found in each site.

Fossils recovered during 1982 occur in four basic geographic/stratigraphic areas. Middle Miocene fossils occur in sedimentary intercalations in a volcanic sequence in the Nachola area 10–15 km west of Baragoi (Figs. 1–3). Upper Miocene fossils occur in the Namurungule Formation Samburu Hills 27–32 km west of Baragoi (Figs. 1, 4–6). Mio-Pliocene fossils occur in the Kongia area a few kilometres north of the Namurungule Formation, while Holocene fossils are found in grey silts near the Suguta Valley and in travertine and terrace deposits in the drainage systems of the Samburu Hills (Figs. 8, 9). Undoubtedly a great many additional sites await discovery.

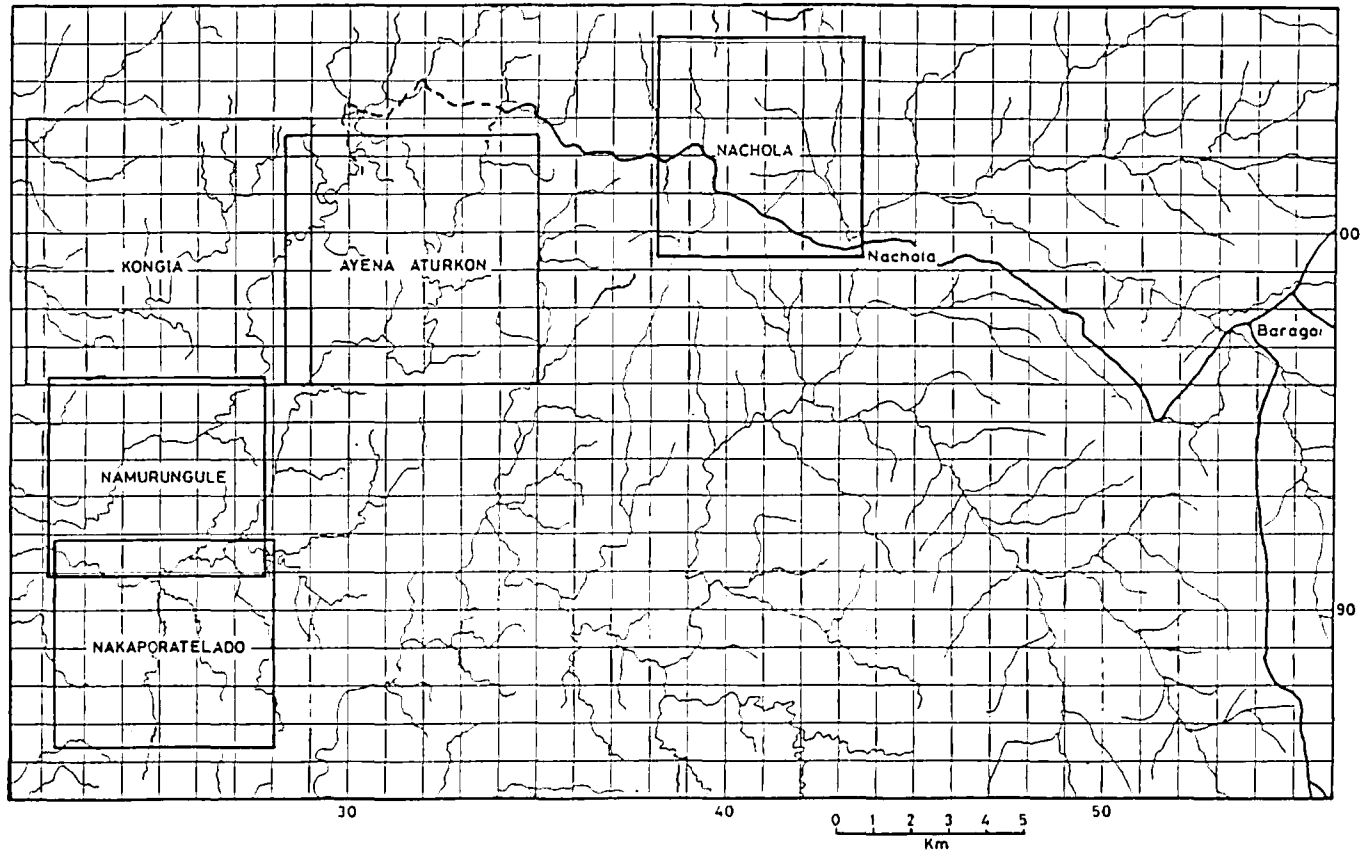


Fig. 1. Location Map: Baragoi-Samburu Hills

*The Nachola Area* (Fig. 2)

Fossil sites have already been reported in this area (Ishida *et al.*, 1982; Baker, 1963). Mammals tend to be rare in the sediments of the Nachola area, but crocodile and turtle remains are abundant at some sites. Fossil wood is also common at certain levels in the Emuruilem Member. The most

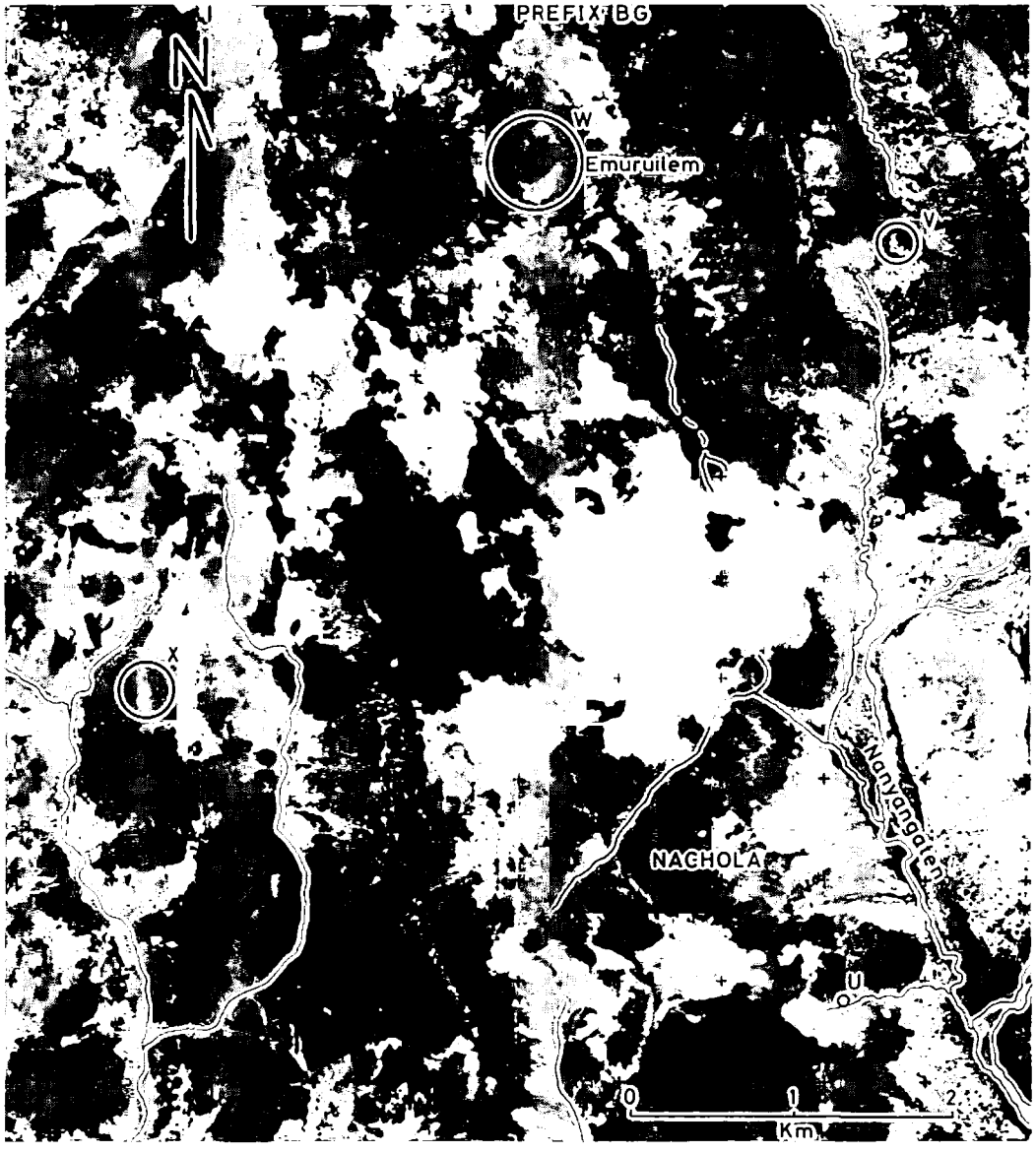


Fig. 2. Nachola Sheet

important site found in this area during 1982, was the Site BG X, which yielded a number of fossils provisionally assigned to *Kenyapithecus*, plus a few other mammals. Figure 3 summarises the collections from the Nachola Sites. It should be noted that fossils occur in sediments at various levels in the succession. The lowermost deposits occur below the volcanic sequence at the eastern edge of the volcanic field. Above this is a series of phonolitic and basaltic lavas with intercalated tuffs and sediments which yield abundant fossil wood and rarer mammals. The upper part of the Nachola sequence is comprised of a thick sequence of basaltic lavas.

| TAXON / SITE | Pisces | Crocodilia | Trionyx | Pelomedusidae | Aves | Kenyapithecus | Small ape | Gomphotheriidae | Deinotherium | Rhinocerotidae | Giraffidae | Tragulidae | Ruminant | Mammal | Quantity of fossils |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| U | | ● | | ● | | | | | | ● | | | | | 75 |
| V | | ● | | ● | | | | | | | | | | ● | 38 |
| W | | | | | | | | | | | | | | ● | 3 |
| X | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | | | 73 |

Fig. 3. Distribution of fauna – Nachola

*The Samburu Hills Area* (Figs. 4 and 5)

The uppermost Member of the Aka Aiteputh Formation, comprises palaeosols, weathered basalts and siliceous limestones, and minor fluvial sediment lenses. It is generally poorly fossilerous but has yielded molluscs and mammals (Figs. 4, 5 and 6).

Baker (1963) provides a brief description of the Namurugule strata, which he included in his Tirr Tirr Series. The strata are, however, stratigraphically well below the Tirr Tirr Formation which has been dated at 3.8 m.y. (Baker *et al.*, 1971). Uncomforably below the flat lying Tirr Tirr Alkali Rhyolite occurs a westward dipping sequence of Nagubarat and Kongia Basalts with intercalated sediments, best exposed in the Kongia area (Fig. 8). Unconformably below these lavas occurs the Namurungule Formation which is Upper Miocene in age. A large number of sites is now known in

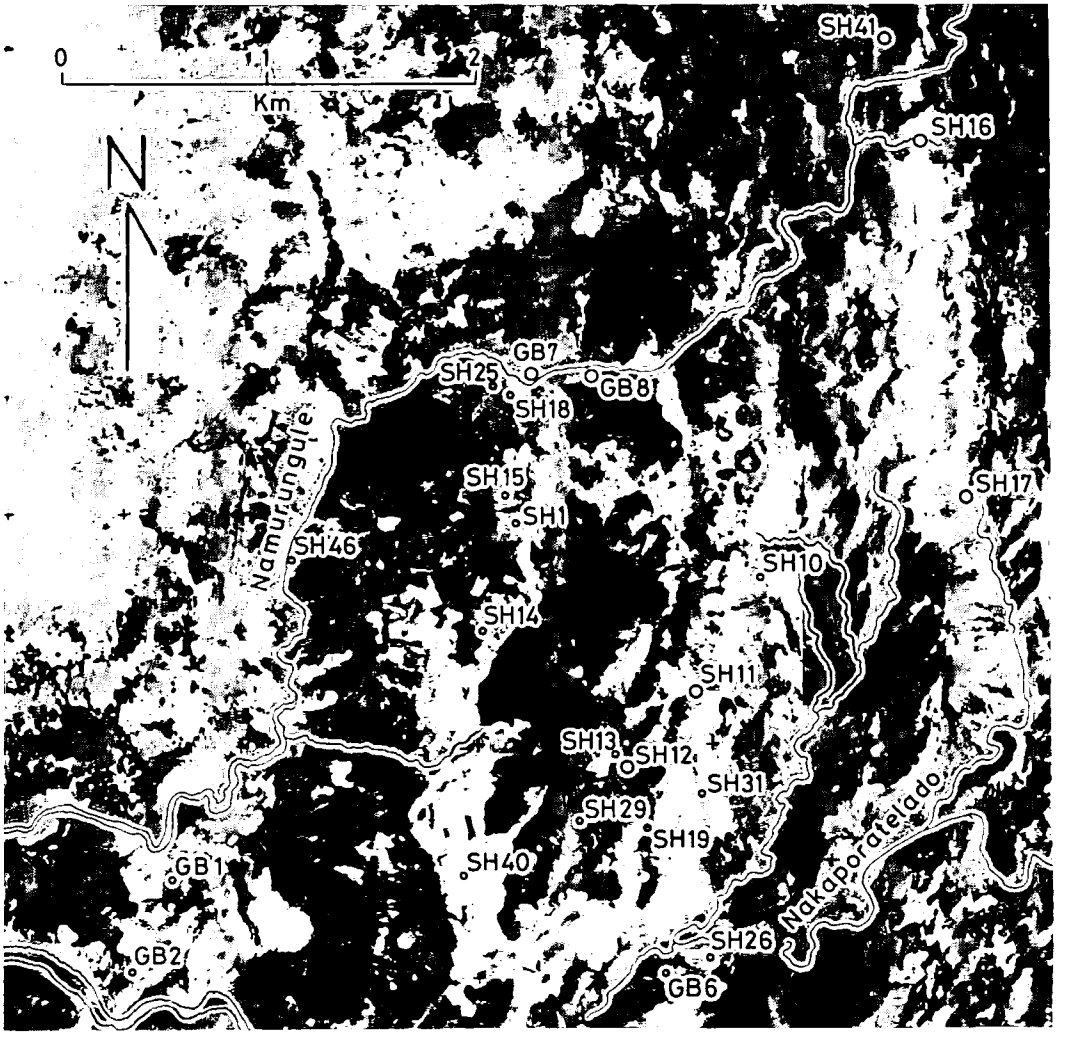


Fig. 4. Namurungule Sheet

the Namurungule Formation (Figs. 4 – 6), but most of them yield rather scrappy fragments of bone and teeth. Aquatic faunal elements are frequently found, but terrestrial fossils occur in many of the sites. Probably the most interesting and important site found in 1982 is Site SH 22 which yielded an important hominoid specimen plus a moderately diverse vertebrate fauna. *Hipparion* and bovids occur at many sites while giraffids are rarer. *Deinotherium* and *Tetralophodon* are moderately well represented in the collections, while most other mammalian taxa are rare. Fossil fish, turtles and crocodiles are ubiquitous. Gastropods are, however, notable by their absense.


Fig. 5. Nakaporatelado Sheet

Two intriguing sites yielding impressions of leaves, feathers and foot prints were found (Fig. 10). The well-bedded facies common over much of the Namurungule area may well contain many more such sites.

| LOCALITY \ TAXON | Gastropoda | Pisces | Crocodilia | Pelomedusidae | Trionychidae | Varanidae | Ophidea | Aves | Hominoidea | Orycteropodidae | Deinotherium | Tetralophodon | Carnivora | Rhinocerotidae | Chalicotheriidae | Hipparion | Nyanzachoerus | Kenyapotamus | Giraffidae | Tragulidae | Bovidae | Quantity of Fossils |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | | • | | | | | | | | | | | | | | | | | | | | 38 |
| 4 | | • | • | • | • | | • | | | | | • | | • | | • | • | | | • | • | 161 |
| 5 | | • | • | • | • | | | | | | | • | | | | • | | | • | | | 43 |
| 6* | | | | | • | | | | | | • | | | | | | | | | | | 10 |
| 7 | | | | • | • | | | | | | | | | • | | | | | | | | 29 |
| 8 | | • | • | • | • | | | | | | | | | | | | | | | | | 142 |
| 9 | | | • | | | | | | | | | | | • | | • | | | • | | • | 67 |
| 10 | | | | | | | | | | | | | | | | • | | | | | | 2 |
| 11 | | | • | | | | | • | | | | | | | | • | • | | | | • | 51 |
| 12 | | | • | • | • | | • | • | | | • | • | | • | | • | • | • | • | | • | 107 |
| 13 | | | • | | | | | | | | | | | | | | | | | | | 30 |
| 14 | | • | • | | • | • | | • | | | | | • | | • | • | | | | | • | 46 |
| 15 | | • | • | • | • | | | | | | | • | | • | | • | | | | | | 22 |
| 16 | | • | • | | | | | | | | | • | | • | | • | | | • | | • | 24 |
| 17* | • | | | | | | | | | | | | | | | | | | | | | 26 |
| 18 | | | • | | | | | | | | | | | | | | | | | | • | 6 |
| 19 | | | | | | | | | | | | | | | | • | | | | | | 1 |
| 20 | | • | • | • | • | | • | | | | • | | | • | | • | | | • | | • | 38 |
| 21 | | • | • | • | • | | | | | | • | | | | | • | | | • | | • | 32 |
| 22 | | • | • | • | • | | | | • | | | • | | • | | • | | | • | | • | 166 |
| 23 | | • | • | • | • | | | | | | | | | | | • | • | | | | • | 24 |
| 24 | | • | • | • | • | | | | | | • | | | • | | • | | • | | | • | 22 |
| 25 | | | • | • | • | | | | | | | | • | • | | • | • | | • | | • | 28 |
| 26 | | • | | | | | | | | | • | | | | | | | | • | | • | 28 |
| 27 | | • | • | • | • | | | | | | • | | | • | | • | | | | | • | 67 |
| 28 | | • | • | • | • | | | | | | • | | | | | • | • | | • | | • | 19 |
| 29 | | | | | | | | | | • | | | | | | | | | | | | 1 |
| 30 | | • | • | • | • | | | | | | | | | | | • | | • | • | | • | 37 |
| 31* | | | | | | | | | | | | | | | | | | | | | • | 9 |
| 32 | | • | | | | | | | | | | | | | | | | | | | | 11 |
| 33 | | | | | | | | | | | | • | | | | | | | | | | 4 |
| 34 | | • | | • | • | | | | | | • | | • | | | | | | | | • | 42 |
| 35 | | | | | | | | | | | | • | | | | | | | | | | 1 |
| 36 | | • | • | • | • | | | | | | | | | | | | | | • | | | 26 |
| 37 | | • | • | • | • | | | | | | | | | • | | | | • | | | • | 18 |
| 38 | | • | • | • | • | | | | | | | | • | | | • | | | | | | 13 |
| 39 | | • | | • | • | | | | | | | | | | | | | | • | | | 1 |
| 40 | | | | | | | | | | | • | | | | | | | | | | | 1 |
| 41 | | | | | | | | | | | | | | | | • | | | | | | 4 |
| 42 | | | | | | | | | | | | • | | | | | | | | | | 1 |
| 43 | | • | • | • | • | | | | | | | | | | | | | | • | | | 5 |
| 44 | | • | • | • | • | | | | | | | | | | | | | | | | | 16 |
| 45* | | | | | | | | | | | | • | | | | | | | | | | 1 |
| 46* | | | | | | | | | | | • | | | | | | | | • | | | 2 |
| 49 | | | | | | | | • | | | | | | | | | | | | | | 1 |

Fig. 6. Distribution of Fauna – Namurungule (*Aka Aiteputh Formation)

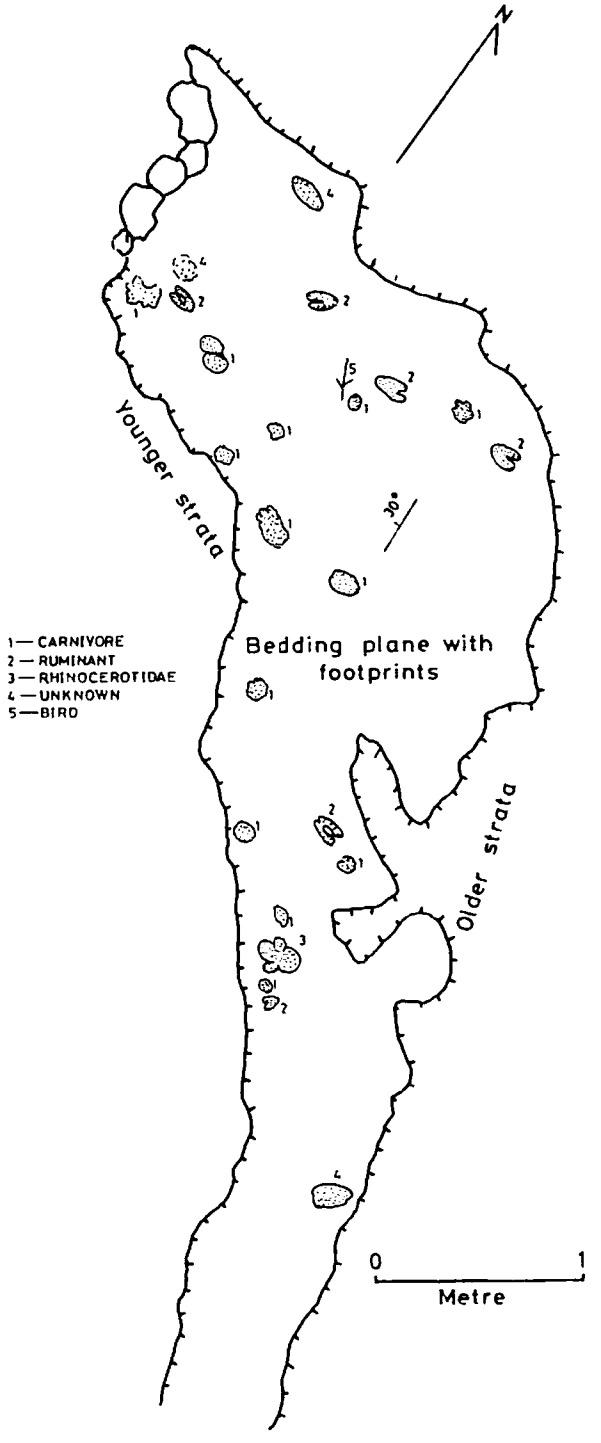


Fig. 7. Footprints at Site 32


Fig. 8. Kongia Sheet

*The Kongia Area* (Fig. 8)

Six to seven kilometres north of the Namurungule Formation is a thick succession of basaltic lavas. In a few places thin sedimentary intercalations are known to occur between lava flows (Fig. 8). A very preliminary survey made in 1982 indicated the palaeontological potential of this sequence, which unconformably overlies the Namurungule Formation. Two richly fossiliferous


Fig. 9. Ayena Aturkon Sheet

sites were found, both of which yielded abundant Mollusca, but few vertebrates. However, one of the sites (SH 47) yielded *Hippopotamus*, fish and a varanid. The hippo is particularly interesting as it is the earliest local record of this group. The older Namurungule sites, although clearly aquatic in their depositional environments, have not yet yielded *Hippopotamus*. This finding is in accord with currently available information concerning hippopotamid origins and distribution (Pickford, 1983) which suggests that the earliest known *Hippopotamus* occurrences in Kenya are about 7

million years old. Prior to this time, hippopotamids were represented by *Kenyapotamus*, the genus which occurs at Namurungule. A separate report on the Kongia Mollusca has been prepared (Pickford, 1984).

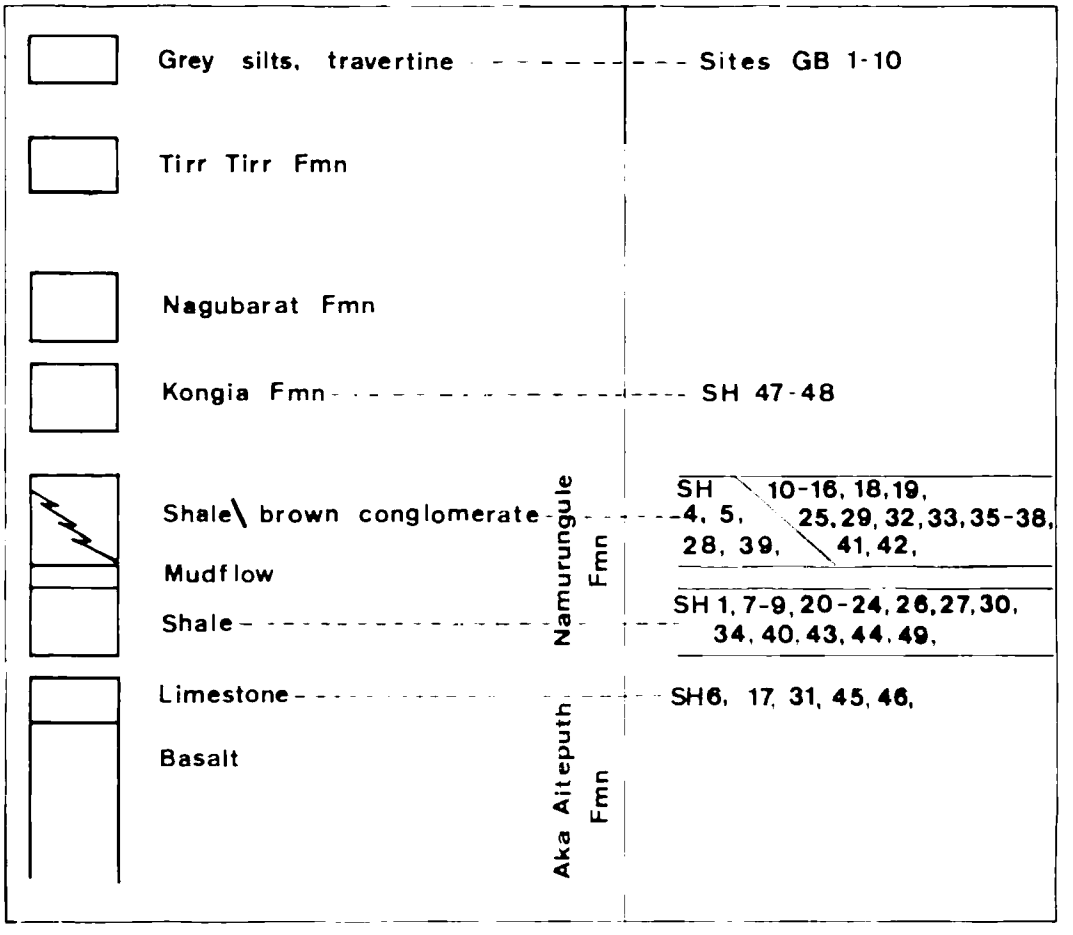


Fig. 10. Stratigraphic Positions of fossil sites: Samburu Hills

*Holocene Sites*

Holocene sediments occur in the Suguta Valley as well as in the present day drainage feeding into the valley. High level terrace deposits occur extensively in the Samburu Hills. These presumably accumulated during a period when the Suguta Valley was filled with water. The resemblance of the grey silt facies to the Galana Boi Formation, which occurs further north in the East Turkana area, is marked.

In some areas higher than the highest lake terraces, occur river terraces and travertine deposits. The latter frequently contain fossil leaves and molluscs. A separate report (Pickford, 1984) discusses the distribution of Molluscs in the Holocene sediments.

In the vicinity of Baragoi Township is a series of fluviatile deposits which contains subfossil snails and vertebrates (Site GB 11).

The value of the Holocene deposits lies in the information they impart about conditions in the Samburu area in the recent past. The Baragoi site contains molluscs usually found in conditions much colder than those prevailing at Baragoi today. The Suguta Valley, when full of water would undoubtedly have had a marked effect on the local climate. The travertine deposits indicate the former existence of lime charged water seepages in an area which is now virtually waterless.

ACKNOWLEDGEMENTS We acknowledge the help of the following organizations and individuals:

The Japanese Ministry of Education, Science and Culture,

The Kenyan National Council of Science and Technology,

The Office of the President of the Kenya Government, Administrators of the Samburu District,

Mr. Richard E.F. Leakey, Director Chief Executive of the National Museums of Kenya,

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